



Demographic Characteristics of 796 Patients Operated for Lumbar Disc Herniation in Thrace Region, Turkey

Türkiye Trakya Bölgesinde Lomber Disk Herniyasyonu Nedeniyle Opere Edilen 796 Hastanın Demografik Özellikleri

Intervertebral Disc Disease, Demographic Analytical

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Özet

Amaç: Bu çalışma, Türkiye'de Trakya bölgesinde lomber disk herniyasyonu nedeniyle opere edilen hastaların demografik özelliklerini belirlemek amacıyla yapıldı. **Gereç ve Yöntem:** Tek seviye, tek taraf ve hayatların da ilk defa lomber disk herniyasyonu nedeniyle opere edilen hastalar retrospektif olarak tarandı. **Bulgular:** Toplam 796 hastadan, 336 (42%) hasta erkek, 460 (58%) hasta kadın idi. L1 - 2 vertebra seviyesinde 4 (0.5%) hasta, L2 - 3 vertebra seviyesinde 15 (1.9%) hasta, L3 - 4 vertebra disk seviyesinde 51 (6.4%) hasta, L4 - 5 vertebra disk seviyesinde 412 (51.8%) hasta ve L5 - S1 vertebra disk seviyesinde ise 314 (39.4%) hasta kayıt altına alındı. Üst seviye lomber disk herniyasyonu (L1 - 2, L2 - 3, L3 - 4) nedeniyle 70 (8.9%) hasta opere edilmişken, 726 (91.1%) hasta alt seviye lomber disk herniyasyonu (L4 - 5, L5 - S1) nedeniyle opere edildi. Lomber disk herniyasyonunun görüldüğü seviye ile ağır fiziksel aktivite arasında güçlü bir pozitif korelasyon saptandı. ($P < 0.05$, $P = 0.103$) Lomber disk herniyasyonu görülen seviye ile yaş arasında ise negatif bir korelasyon saptandı. ($P < 0.05$, $P = -0.404$). **Tartışma:** Toplanan veriler literatür bilgileri ile uyumlu idi. Alt seviye lomber disk herniyasyonlarında ağır fiziksel aktivite, istatistiksel olarak güçlü bir etken olarak saptandı. Saptanan lomber disk herniyasyonu ile yaş arasındaki güçlü negatif korelasyon saptanması, ilerleyen yaş ile birlikte lomber disk herniyasyonunun üst seviyelerde görülmesini desteklemektedir.

Anahtar Kelimeler

Intervertebral Disk Hastalığı; Diskektomi; Demografik Analiz

Abstract

Aim: This study was designed to determine the demographic characteristics of patients operated for lumbar disc herniation in Thrace Region, Turkey. **Material and Method:** We retrospectively searched our data to find out patients who had one sided, one level and only one spinal surgical intervention for herniated lumbar disc. **Results:** Among 796 cases, 336 (42%) were men and 460 (58%) were women. The level of the pathology is determined as L1 - 2 for 4 cases (0.5%), L2 - 3 for 15 cases (1.9%), L3 - 4 for 51 cases (6.4%), L4 - 5 for 412 cases (51.8%) and as L5 - S1 on 314 cases (39.4%). While a total of 70 cases (8.9%) were identified on upper-levels (L1 - 2, L2 - 3, L3 - 4); 726 cases (91.1%) were found to be on lower-levels (L4 - 5, L5 - S1). A mild positive correlation between the pathology level and physical activity intensity ($P < 0.05$, $P = 0.103$) has been demonstrated; as well as a strong negative correlation between pathology level and mean age ($P < 0.05$, $P = -0.404$). **Discussion:** The demographic characteristics are consistent with the literature. Physical activity intensity influence on lower-level herniations might have significance due to the large sample size. The strong negative correlation between pathology level and mean age suggests that the degeneration raises the frequency of upper-level herniations.

Keywords

Intervertebral Disc Disease; Discectomy; Demographic Analysis

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Introduction

In neurosurgical practice low back pain is the most common complaint that physicians encounter. 70% of people suffer from severe back pain at least once at some point in their lifetime [1]. Sciatica is a common disorder, which is frequently caused by the most common is lumbar disc disease which is also the cause of the majority of the loss of labour and the most frequent cause of morbidity [2-3]. Lumbar disc disease is identified in the early 1930's and had been treated since then [4-5]. It is the most frequent group of diseases that past and present neurosurgeons deal with and perform operations for. With all these aspects lumbar disc disease is an important socio-economic and public health problem. In this article authors discussed the demographic characteristics of 796 patients operated for lumbar disc herniation in Thrace Region, Turkey.

Material and Method

In our study, data on patients who have undergone operation for lumbar disc herniation, in Thrace region were analyzed retrospectively. Inclusion criterion was single level lumbar disc herniation patients undergoing lumbar spinal surgery for the first time. All patients were operated using microdiscectomy technique. Parameters such as gender, age, occupation, the level of disc pathology and location of the herniation have been investigated.

The gender is coded as 0 for female and 1 for male. The age of patients is noted in years. The occupation of patients is classified as mild, moderate and heavy according to the physical activity required. Hard labour workers, farmers, soldiers and patients having similar occupations are classified in heavy physical activity group. Housewives, health care workers and patient with similar occupations are categorized in medium physical activity group. And government employees, students and patients with desk jobs are classified in mild physical activity group. The level of disc pathology is coded as 1 for L1 - L2 level, as 2 for L2 - L3, respectively until L5 - S1 level for which it is coded as 5. The location of the herniation is coded as " L " for left, as " R " for right and as " C " for central.

Descriptive analysis were performed for all the parameters, including mean, median, standart deviation and variance for age, and frequency tables for qualitative variables. A chi-square test was performed to compare level of the herniation and physical activity parameters. A Kruskal Wallis test was performed to compare variances of age between levels of the herniation. Assuming level and physical activity parameters as quantitative variables, a Spearman's Regression Analysis was performed to question a nonparametric correlation between parameters of age, level and physical activity.

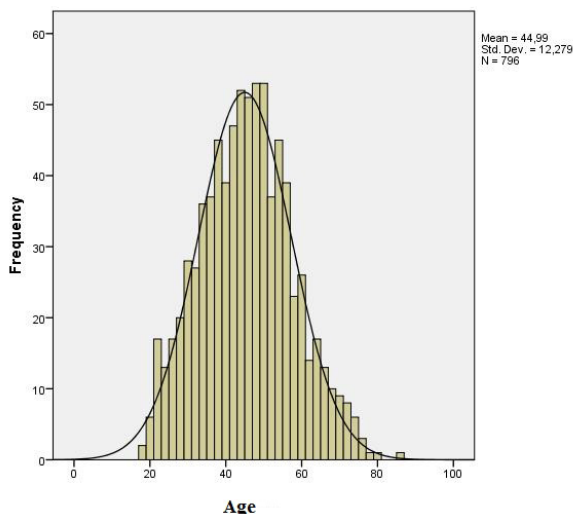
Results

Data on 1434 patients who underwent spinal surgery is analysed retrospectively. Patients with lumbar disc herniation was performed single level discectomy, who have never been undergone lumbar spinal surgery and data on whom were available, are included into the study. 796 cases comprising the inclusion criterion are identified.

Amongst 796 cases 336 (42%) were men, while 460 (58%) were women. Mean and median age was 45 years (± 12.3 years) and

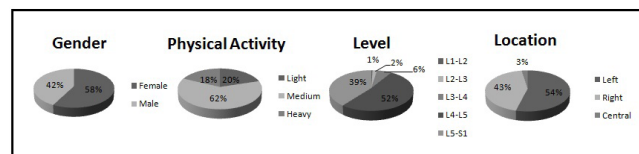
age range was 18 – 85 years (Figure 1). While 20 patients (3%)

Figure 1. Histogram of Age Variable



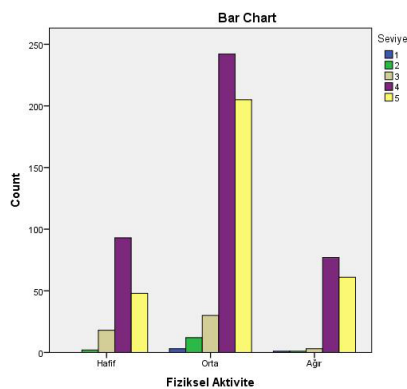
had a central herniation, 346 patients (43%) had a herniation at the right side and 430 patients (54%) had a left-sided one. As patients are categorized according to their physical activity, 161 (20.2%) were in light activity group, 492 (61.8%) were in mild activity group and 143 (18%) were in heavy activity group. The level of herniation is determined as L1 - 2 on 4 cases (0.5%), as L2 - 3 on 15 cases (1.9%), as L3 - 4 on 51 cases (6.4%), as L4 - 5 on 412 cases (51.8%) and as L5 - S1 on 314 cases (39.4%). Location of the herniated disc was left on 430 cases (54%), central on 20 cases (2.5%), and right on 346 cases (43.5%). The results on percentages on categorical variables

Figure 2. Percentages on Gender, Physical Activity, Level and Location of Pathology



are summarized in (Figure 2). A performed Chi-Square test showed significant difference between the distribution of pathology level amongst physical activity groups (P < 0.05) (Figure 3). And a Spearman's Regression

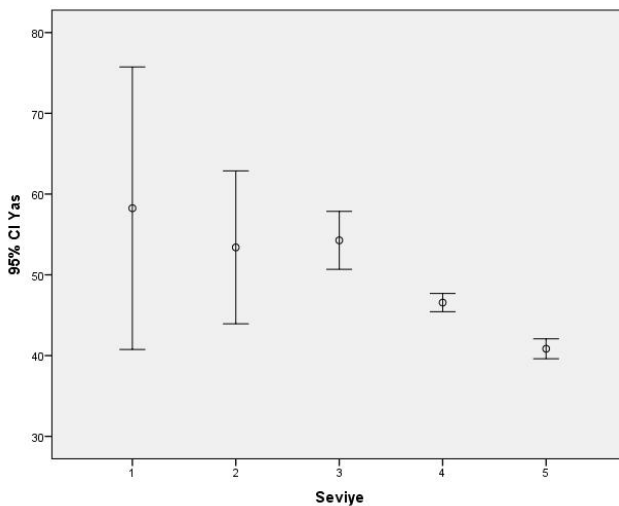
Figure 3. Levels of disc pathology classified according to physical activity intensity



Analysis was performed which showed a statistically meaningful positive correlation between pathology level and physical activity parameters ($P < 0.05$, $P = 0.103$).

A performed Kruskal-Wallis test showed significant difference between mean ages amongst levels of disc pathology ($P < 0.05$) (Figure 4). And a Spearman's Regression Analysis was performed which showed a statistically meaningful negative correlation between pathology level and mean age ($P < 0.05$, $P = -0.404$).

Figure 4. Chart showing 95 % confidence intervals of age for each level



Discussion

Lumbar disc herniation is reported more often in men with frequency of 65 - 80% [6]. In a series of 654 consecutive cases 61% of the patients were male while 39% of them were female [7]. Although it is thought to be slightly more common in males, many studies report similar rates on both sexes. In our study percentages were 42% and 58% for men and women respectively.

Lumbar disc herniation is most commonly seen in the 30 - 50 years old age group [8]. This may be due to the fact that this period is the most active part of working life. In our study, herniations at levels L4 - 5 and L5 - S1 were frequent in the 30 - 50 years old age group, which is in accordance with the literature. Nevertheless, upper-level lumbar disc herniations were determined to be more common in the 40 - 60 years old age group. In our study a significant difference between mean ages amongst levels of disc pathology ($P < 0.05$) and a statistically meaningful and strong negative correlation between pathology level and mean age ($P < 0.05$, $P = -0.404$) are determined; so that upper-level herniations seems to be more frequent in older ages.

Due to the biomechanical properties of the lumbar spine, disc herniations usually occur at L4 - 5 and L5 - S1 levels. While some studies report 80 - 90% of the cases at this level [6-9], another study reported a percentage of 98% [10]. Similarly in our study, 91 % of the lumbar disc herniations were at these two most common levels. Lumbar disc herniations at level L1 - 2, L2 - 3 and L3 - 4 are called upper-level lumbar disc herniations which are relatively uncommon. Magnetic resonance imaging is used more and more frequently, consequently the incidence of upper-level disc herniations have an upward trend [11]. While a study reported 0.28%, 1.3% and 3.6% percentages for L1 - 2,

L2 - 3 and L3 - 4 levels respectively [12]; another study reported a total of 8.8% percentage for upper-level herniations [13]. In our study, results were similar to the literature data: 0.5%, 1.9% and 6.4% for L1 - 2, L2 - 3 and L3 - 4 levels respectively and a total of 8.89%.

Known risk factors are frequent weight lifting, frequent twisting and bending of the lumbar spine, exposure to vibrations, sedentary life style and motor vehicle driving [14-17]. It is thought that physical activity intensity of the occupation has an influence on the formation of lumbar disc herniation. Occupations requiring heavy physical activity, along with professions that require prolonged sitting are the most suspected ones as causes. In a study it is reported that 67% of active employees develop lumbar disc herniation [11]. Occupations involving weight lifting, prolonged sitting or standing, travelling and exposure to vibration are reported to pose a risk for the development of lumbar disc herniation [18]. In a case series of 654 patients, weight lifting for 31%, a fall accident for 10 % and heavy sports activity for 10 % have been demonstrated as etiological factors [9]. In our study a statistically significant difference ($P < 0.05$) between the distribution of pathology level amongst physical activity groups has been determined, as well as a statistically meaningful positive correlation between pathology level and physical activity parameters ($P < 0.05$, $P = 0.103$). Nevertheless, we consider these findings especially the feeble positive correlation, as a result of random variation, rather than clinically relevant result and think that significance is mainly caused by the relatively large sample size.

When cases of lumbar disc herniations in our region operated for the first time at single level are reviewed, our results revealed that most of the demographic characteristics are consistent with the literature. Intensity of the physical activity might have an influence on lower-level herniations, although we consider the effect detected as a result of statistical artifact caused by large sample size. A significant difference between mean ages among levels of disc pathology and the strong negative correlation between pathology level and mean age suggest that degeneration with age rises the frequency of upper-level herniations.

Competing interests

The authors declare that they have no competing interests.

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